REMARKS

35 U.S.C. § 103 Rejections

The Examiner has rejected claims 2, 3, 5, 6, 18-20, 22, and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over Burwen (US 3,184,349) in view of Dullberg (US 3,185,600) and further teaching of Akram (US 2001/0035557) to Okuno (US 4,961,987).

Claims 2, 3, 5, 6, 18-20, 22, and 24-26 have been cancelled. New claims 27-43 have been added.

Independent claims 27, 38, and 41 include a two-step cooling process of either placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Burwen, Dullberg, Akram, and Okuno do not teach or suggest a two-step cooling process of placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Burwen does not teach or suggest a two-step cooling process. Burwen teaches a method for quench cooling a complicated metal shape while substantially avoiding distortion of the shape. A brazed assembly formed of the alloy 6061 is heated to about 970 degrees Fahrenheit (Column 3, lines 5-7). The assembly is then quenched by directing a massive flow of a refrigerated gaseous stream substantially simultaneously to all parts of the assembly and continuing the flow thereto until the assembly has cooled down to below the age-hardening temperature of the alloy from which it is constructed (Column 3, lines 7-12). As shown in Figure 2, a

refrigeration device is provided. The device has a container 20 with a rack 21 and shelves 22 and blocks of dry ice 23 on the shelves 22. Using the dry ice 23 the air in the device is refrigerated to between -40 and -50 degrees Fahrenheit. The air is forced to leave the container 20 to be a flexible conduit 25 and enter a hood 26. After the assembly is heated it is placed under the hood 26 where it is cooled. Burwen thus discloses a process including heating an aluminum assembly and a one-step cooling process of exposing the assembly to refrigerated air. Specifically, Burwen does not teach or suggest a two-step cooling process of placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Dullberg does not teach or suggest a two-step cooling process. Dullberg teaches a quenching method for metal parts undergoing heat treatment for improving the physical properties thereof, such as full hardness, strength, and corrosion resistance for heat treatable aluminum alloys and all materials which experience a microstructural transformation nearing the cooling. The aluminum part is heated by suitable means for a period of time sufficient to cause at least part or one or more of the constituents of the material to melt or go into solution (Column 3, lines 17-22). When the heating step has been completed, the part is then taken from the heating means and plunged directly into the liquid nitrogen contained in the dip tank (Column 3, lines 26-29). The time factor between the heating operation and the quench is critical in that the best metallurgical properties are obtained when the part is taken as rapidly as possible from the solution heat

treating temperature level to a cryogenic temperature level (Column 3, lines 30-34). Any time lag between these two steps will adversely affect the physical benefits which are achieved (Column 3, lines 34-36). Therefore, Dullberg actually teaches away from having an extra step in the cooling process before the aluminum part is dipped into the liquid nitrogen. Dullberg thus teaches heating the aluminum part so that it at least partially melts and then immediately dipping the aluminum part directly into liquid nitrogen. Specifically, Dullberg does not teach or suggest a two-step cooling process of placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Akram does not teach or suggest a two-step cooling process. Akram teaches a semiconductor package that increases the conduction of heat away from the die during use. Metals are used in a housing structure that is abutted against the die in a thermally conductive manner to facilitate heat transfer away from the die (Paragraph 0029). Akram does not mention any process for heating or cooling a thermal dissipation device. Akram thus discloses a semiconductor package with a conductive block housed on the die. Specifically, Akram does not teach or suggest s two-step cooling process of placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Okuno does not teach or suggest a two-step cooling process. Okuno teaches an aluminum nitride sintered body for use in a heat sink (Column 1, lines 13-15). The material of the body is sintered at 1500-2000° C (Column 3, lines 12-13). The thermal conductivity of the heat sink increases as grain size increases (Column 4,

lines 64-65). <u>Okuno</u> does not mention any process for cooling the sintered body. <u>Okuno</u> thus teaches a method of sintering a body for use in a heat sink. Specifically, <u>Okuno</u> does not teach or suggest s two-step cooling process of placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Specifically, <u>Burwen</u>, <u>Dullberg</u>, <u>Akram</u> and <u>Okuno</u> do not teach or suggest a two-step cooling process of placing the thermal dissipation device in a first medium then a second medium or lowering the temperature at two different speeds.

Claims 27 and 41 include a two-step cooling process of placing the thermal dissipation device in a first medium to lower the temperature to an intermediate temperature and placing the thermal dissipation device in a second medium to lower the temperature to a cryogenic temperature. Specifically, claims 27 and 41 include the limitations "exposing the thermal dissipation device to a first medium to lower the temperature of the thermal dissipation device to an intermediate temperature, " and "exposing the thermal dissipation device to a second medium to lower the temperature of the thermal dissipation device to a cryogenic temperature, the cryogenic temperature being below the intermediate temperature."

Claim 38 includes a two-step cooling process of lowering the temperature of the thermal dissipation device at two different speeds. Specifically, claim 38 includes the limitations "lowering the temperature of the material to an intermediate temperature at a first rate" and "lowering the temperature of the material to a cryogenic temperature at a second rate."

Therefore, claims 27, 38, and 41 are patentable over Burwen in view of Dullberg and further teaching of Akram and Okuno because claims 27, 38, and 41 include limitations not taught or suggested by Burwen, Dullberg, Akram, and Okuno.

Claims 28-37, and 39-40 and 42-43, are dependent on either claims 27, 38, or 41 and should be allowable for the same reasons as claims 27, 38, and 41.

Applicant respectfully submits that the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Michael A. Bernadicou at (408) 720-8300.

Please charge any shortages and credit any overages to Deposit Account No. 02-2666. Any necessary extension of time for response not already requested is hereby requested. Please charge any corresponding fee to Deposit Account No. 02-2666.

Respectfully submitted,

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